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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/835,491	04/17/2001	Kinya Ozawa	109137	5417

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EXAMINER	
DUONG, THOI V	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 03/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	09/835,491	OZAWA ET AL.	
	Examiner	Art Unit	
	Thoi V. Duong	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Amendment filed December 07, 2004.

Accordingly, claims 1, 7 and 10 were amended, and claim 3 was cancelled. Currently, claims 1, 2, and 4-10 are pending in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bos et al. (USPN 6,141,074) in view of Numano et al. (USPN 6,313,898 B1) and Park (USPN 6,160,535).

Re claim 1, as shown in Fig. 1, Bos discloses a pixel area 10 of an active matrix liquid crystal display (LCD) device (col. 1, lines 15-18), comprising:

first and second substrates, the first substrate 14 having a surface proximate the second substrate , the second substrate 16 being a surface proximate the first substrate; an alignment film (not shown) disposed at each of the surfaces of the first and second substrates (col. 4, lines 1-65);

liquid crystal 12 disposed between the first and second substrates;

wherein a pretilt angle due to the alignment film is 0.5° to 30° for liquid crystal having positive dielectric anisotropy (col. 6, lines 33-37);

wherein, re claim 2, the alignment film includes one of silicon oxide and silicon nitride (col. 8, lines 14-26).

Although Bos does not disclose the structure of the LCD device in details, it would have been obvious to one having ordinary skill in the art that the active matrix LCD device of Bos comprises a plurality of scanning lines; a plurality of data lines; pixel areas defined by the scanning lines and the data lines; a switching element provided in each pixel area; and a pixel electrode provided in each pixel area.

Bos discloses a LCD device that is basically the same as that recited in claim 1 except for a relationship between a thickness of the liquid crystal and a space between the pixel electrodes, and a driving method for the adjacent pixels.

As shown in Fig. 23 Prior Art, Numano et al. discloses that if a thickness of the liquid crystal disposed the first and second substrates is represented as d, and a space defined between the pixel electrodes is represented as L, a ratio d/L is at least 1; for example, when the thickness d of the liquid crystal is 5 micrometer, the space L between the pixel electrodes is 2 through 5 micrometer (col. 2, lines 8-17). Numano et al. also discloses that the alignment film exists on both first and second substrates (col. 2, lines 4-5). Accordingly, the same alignment film is formed in space between body portions of pixel electrodes 12.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD device of Bos with the teaching of Numano et al. by forming the two substrates and the pixel electrodes such that a ratio of a gap between the substrates and a spacing between the pixel electrodes is at least 1,

wherein the spacing between the pixel electrodes is 2 or 3 micrometer for preventing the disclination caused by the lateral direction electric field (col. 1, lines 36-52).

Further, Park discloses a conventional driving technique involving applying voltages having different polarities to pixels that are adjacent to each other by driving alternating pixel elements with negative and positive voltages as shown in Figs. 1B-1C to prevent the display from reducing sensitivity and brightness (col. 1, lines 51-64).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the liquid crystal device of Bos et al. with the teaching of Park by applying voltages having different polarities to adjacent pixels so as to improve display characteristics (col. 2, lines 10-12).

4. Claims 4, 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bos et al. (USPN 6,141,074) in view of Numano et al. (USPN 6,313,898 B1) and Park (USPN 6,160,535) as applied to claims 1 and 2 above and further in view of Ichikawa et al. (USPN 6,339,459 B1).

The LCD device of Bos et al. as modified in view of Numano et al. and Park above includes all that is recited in claim 4, 5, 7 and 8 except for a projection type display apparatus and an electronic apparatus employing such LCD device.

Re claim 5, as shown in Figs. 1A-1C, Ichikawa discloses a projection type display apparatus comprising a light modulating device that modulates light emitted from the light source, the light modulating device including the liquid crystal device 1302.

Re claim 4, Fig. 4 shows a LCD device comprising pixel electrodes 1326 formed of Al (light-reflecting metal electrode) and a liquid crystal layer 1325 (col. 8, lines 25-30).

Re claim 8, Ichikawa also discloses in prior art that the LCD device will be used not only for the personal computers, but also for workstations and televisions for home use (col. 1, lines 11-23).

Accordingly, by having the LCD device of Bos et al., it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ this device in the projection type display apparatus of Ichikawa et al. so as to obtain a full-color projection image color-mixed in each pixel without the mosaic pattern (col. 3, lines 13-17).

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bos et al. (USPN 6,141,074) in view of Numano et al. (USPN 6,313,898 B1) and Park (USPN 6,160,535) as applied to claims 1 and 2 above and further in view of Miyatake et al. (USPN 5,092,664).

The LCD device of Bos et al. as modified in view of Numano et al. and Park above includes all that is recited in claim 6 except for a projection type display apparatus employing such LCD device.

As shown in Fig. 1, Miyatake discloses a projection type display apparatus, comprising:

a light source 15;

a light modulating device that modulates light emitted from the light source, the light modulating device including a liquid crystal device 17; and

a projection lens 18 that projects the light modulated by the light modulating device.

Fig. 2 shows a sectional view of the liquid crystal device 17 wherein alignment films 31, 32 are rubbed in order to align the molecules axes of the liquid crystal molecules at a pretilt angle.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the LCD device of Bos in the projection type display apparatus of Miyatake so as to obtain a display with high picture quality by solving the problem of the brightness gradient (col. 2, lines 33-36).

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bos et al. (USPN 6,141,074) in view of Numano et al. (USPN 6,313,898 B1) and Park (USPN 6,160,535) as applied to claims 1 and 2 above and further in view of Takahara et al. (USPN 6,218,679 B1).

The LCD device of Bos et al. as modified in view of Numano et al. and Park above includes all that is recited in claim 4, 5, 7 and 8 except for a projection type display apparatus employing such LCD device.

As shown in Fig. 24, Takahara et al. discloses a projection type display apparatus comprising:

a light source 241a;

a plurality of light modulating devices that modulates light emitted from the light source, only the light modulating device that modulates light in a blue display portion including a liquid crystal device 243a, wherein, as shown in Fig. 11, the liquid crystal device comprises alignment films 111a and 111b formed of silicon oxide (col. 33, lines 43-50 and col. 43, lines 46-48); and

a projection lens 246a that projects the light modulated by the light modulating device.

Since the LCD of Bos et al. also comprises the alignment films formed of silicon oxide, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ this device in the projection type display apparatus of Takahara et al. so as to accomplish a high luminance display of images (col. 7, lines 15-21).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bos et al. (USPN 6,141,074) in view of Numano et al. (USPN 6,313,898 B1) and Park (USPN 6,160,535) as applied to claims 1 and 2 above and further in view of Sawada et al. (USPN 6,040,890).

The liquid crystal device of Bos et al. as modified in view of Numano et al. and Park above includes all that is recited in claim 9 except for a liquid crystal having a refractive anisotropy "Delta n" in a range of 0.13 to 0.108 and the thickness d being in a range of between 3.2 to 4.4 microns.

As shown in Fig. 1, Sawada et al. discloses a liquid crystal device comprising a liquid crystal layer having the product of a refractive anisotropy and a thickness of the layer ranging within 0.3 = Delta n x d = 1.2, where 0.05 = Delta n = 0.25 (col. 5, lines 58-62 and col. 6, lines 48-50). Sawana et al. teaches that the value of d in Delta n x d can be selected as small for resulting in a preferable response time (col. 47, lines 46-51). Accordingly, if Delta n = 0.119, the thickness d can be selected as 4 microns, the

product of Delta n and the thickness d will be 0.119 x 4 = 0.476, which satisfies the above requirements.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the liquid crystal device of Bos et al. with the teaching of Sawada et al. by employing a liquid crystal having a refractive anisotropy "Delta n" in a range of 0.13 to 0.108 and the thickness d being in a range of between 3.2 to 4.4 microns so as to obtain a good high-speed response, a wide visual range and a high contrast for the display (col. 2, lines 48-52).

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada et al. (USPN 6,040,890) in view of Park (USPN 6,160,535).

As shown in Fig. 1, Sawana et al. discloses a liquid crystal device, comprising:

a first (upper) substrate 1 having a surface;

a second (lower) substrate 1 having a surface that faces the surface of the first substrate;

liquid crystal 3 disposed between the first and second substrates; and

alignment films 2 disposed between the liquid crystal and the surfaces of the first and second substrates; and

a pretilt angle from 0 to 20 degrees (col. 48, lines 36-39).

Sawana et al. teaches that the liquid crystal has the product of a refractive anisotropy and a thickness of the layer ranges within 0.3 = Delta n x d = 1.2, where 0.05 = Delta n = 0.25 (col. 5, lines 58-62 and col. 6, lines 48-50); and that the value of d in Delta n x d can be selected as small for resulting in a preferable response time (col.

47, lines 46-51). Accordingly, if Delta n = 0.119, the thickness d can be selected as 4 microns, the product of Delta n and the thickness d will be 0.119 x 4 = 0.476, which satisfies the above requirements.

Although Sawana et al. does not disclose the structure of the LCD device in details, it would have been obvious to one having ordinary skill in the art that the active matrix LCD device of Sawana et al. comprises a plurality of scanning lines; a plurality of data lines; pixel areas defined by the scanning lines and the data lines; a switching element provided in each pixel area; and a pixel electrode provided in each pixel area (see also Abstract).

Sawana et al. discloses a liquid crystal device that is basically the same as that recited in claim 10 except for the pixels that are adjacent to each other being applied with voltages having different polarities.

As shown in Figs. 1B-1C, Park discloses a conventional driving technique involving applying voltages having different polarities to pixels that are adjacent to each other by driving alternating pixel elements with negative and positive voltages to prevent the display from reducing sensitivity and brightness (col. 1, lines 51-64).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the liquid crystal device of Sawana et al. with the teaching of Park by applying voltages having different polarities to adjacent pixels so as to improve display characteristics (col. 2, lines 10-12).

Response to Arguments

9. Applicant's arguments filed December 07, 2004 have been fully considered but they are not persuasive.

Applicant argued that Numano teaches away from claim 1 since Numano discloses a distance (space) L between adjacent electrodes is 2-5 micrometer. However, the distance L of 2 or 3 micrometer of Numano is still in the range limitation of the space L, which is 1-3 micrometer, recited in claim 1. Therefore, Numano does not teach away from the invention.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-

2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong

02/23/2005

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